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April 29, 2010

Mr. Steve Landino
National Marine Fisheries Service
510 Desmond Drive SE, Suite 103
Lacey, WA 98503-1292
Attn.: Tim Rymer

RE: SR 162, Puyallup River Bridge 162/006 Replacement
Biological Assessment
WSDOT Project No. XL2760

Dear Mr. Rymer:

The Washington State Department of Transportation (WSDOT), on behalf of the Army Corps of Engineers (ACOE) prepared and sent the National Marine Fisheries Service (NMFS) a Biological Assessment (BA) on April 18, 2009, for the above-referenced project.

NMFS forwarded to WSDOT questions concerning the project as described in the BA. These questions and the associated answers are as follows:

1. ***What condition was used as a baseline for the analysis? The existing bridge? It seems obvious that the new (longer) bridge would not impact the 100 year flow water surface elevation (WSE) given the existing constriction between the bridge piers is proposed to be perpetuated (see 4.). To compound matters, additional fill will be added to further constrict the floodway. Have the natural conditions of the river cross-section at this site been identified? I would assume it has been altered by placement of fill for the bridge approaches. Shouldn't baseline conditions used for the backwater analysis take into account the natural condition (prior to placement of fill) and the proposed levee setback projects above and below this location?***

The environmental baseline is the condition existing at the time of consultation (plus anything already consulted on), not predevelopment conditions, or conditions with levee setbacks that have not been consulted on. This would include the existing bridge. This is consistent with the direction in 50 CFR §402.02 -- "Environmental baseline".

Yes, the natural condition of the river cross-section has been identified. The end product for the streambank alignment will match the streambank upstream of the old railroad grade bridge and blend in with the excavated streambank alignment below the new SR 162 bridge on both streambanks (Attachment A [*existing and proposed contours*]).

2. ***About 8 miles upstream ordinary high water (OHW) is considered to be 4,400 cfs as determined by Pierce County and the Corps of Engineers (COE). There are no major tributaries between the two points, so I'm not sure why there is a difference of 8,500 cfs. If the 2 year flow (OHW or thereabouts) event is 12,900 cfs, then what is 100 year flood flow expected to be? Yikes! Information provide to me by Pierce County indicated that Northwest Hydraulic Consultants (NHC) determined it to be 18,600 cfs. I wonder what water surface elevation that would correspond with on the plans. Does anyone know what the highest WSE was (at this site) during the 2006 flood event of 21,500 cfs?***

The earlier figure (12,900 cfs) of the two year flow was incorrect. WSDOT Headquarters reports, based on the Rating Curve for water surface elevation (WSE) of 117.11 feet which is the field verified ordinary high water mark elevation, that the flow rate equals 2,240 cfs (Attachment B [*flow rating curve & ordinary high water mark stats*]). WSDOT believes that the discrepancy between the OHWM flow rates documented by Pierce County and the Corps of Engineers (4,400 cfs) and the flow rates WSDOT analyses illustrated (2,240 cfs) is due to flow becoming hyporeic in the lower extremes of the watershed.

WSDOT does not have WSE figures at this site for the 2006 flood event of 21,500 cfs. The closest estimate we have is from Northwest Hydraulic Consultants (2006). Northwest Hydraulic Consultants completed a hydrologic and hydraulic analysis to update the Pierce County flood insurance study (FIS) for the Federal Emergency Management Agency. The water surface elevations predicted by this study are used by Pierce County for floodplain regulation, and are the most appropriate flood elevations for bridge design (Attachment C [*SR 162 Puyallup River Bridge (162/006) Bridge Replacement Hydraulic Analysis Report*]). The predicted water surface elevations are as follows:

| Event | Flow (cfs) | W. S. Elevation (ft) |
|---|---|---|
| 10-yr | 12200 | 120.7 |
| 100-yr | 18600 | 124.65 |
| 500-yr | 22600 | 125.39 |

3. ***Yes, I may have misinterpreted the demolition plan. But, am I missing something in Step 12 where fill is then deposited back on top of the northern abutment? It appears***

***fill material covers the approach span and the next 20 foot section (or more) as well as the south abutment.***

The end product for the streambank alignment will match the streambank upstream of the old railroad grade bridge and blend in with the excavated streambank alignment below the new SR 162 bridge on both streambanks. There will be no fill protruding into the channel (Attachment A [*existing and proposed contours*]).

4. ***So, are we to believe that once a bridge pier is installed it is there forever because someone may think it's not a good expense of taxpayers' money to remove it? This may affect how the center pier is evaluated on the new bridge at this site. I feel strongly that old bridge abutments in general need to be removed in their entirety because in many cases they create artificial constrictions in the floodway. It has been my experience that they will likely re-appear over time and become a problem. If left in place as proposed, these abutments (along with associated fill) will perpetuate an artificially constricted condition that can adversely affect fish habitat. They will also serve as a good excuse for not removing the abutments on the old bridge (now pedestrian) located immediately upstream, when that structure is replaced. Although it has not been identified, it looks as though this reach could have some potential for a limited dike setback at some point in the future, if the existing piers were not in the way. There is a setback project not far upstream that is currently being worked on and another proposed downstream at the confluence of the Carbon River. I don't think it's a good idea to leave a restricted passage for the river in between those two projects. Rather than placing fill back into the river cross-section, additional room for the river should be created to take advantage of the increased length of the new bridge. In the 2009 flood event water was within a few feet of the girders on the existing bridge. Pieces of large woody material were hitting the bridge as they passed under the structure. The 2006 event is the flood of record in this vicinity.***

Originally, WSDOT proposed to remove the existing bridge piers/abutments to a depth of two feet below the existing grade (elev.108). It is now WSDOT's intent to remove both piers/abutments down to the top of the pier cap, which is 13 feet below existing grade (elev. 105). The project will also grade the streambanks to blend from the streambank contours upstream of the existing pedestrian bridge to the existing streambank contours downstream of the proposed new bridge (Appendix D [*demolition option plans*]).

5. ***It does sound as if WSDOT can specifically request that the trees be removed with root wads attached and set aside for restoration projects in the Puyallup River drainage. I would highly recommend this option to offset the effects of bridge demolition and construction.***

WSDOT conducted additional research on the potential for the trees to be removed and made available for future habitat projects. WSDOT has determined that it is not legal under current State law for WSDOT to donate State resources (the trees) without compensation. WSDOT has notified the current property owner, Pierce County, that they could salvage the trees for restoration projects prior to WSDOT taking ownership. WSDOT may be able to use the trees in nearby restoration projects and will continue to investigate the topic.

**Project Element Change**

The Environmental and Hydraulic Services (EHS) office has been recently informed that abutment armoring will be necessary to protect the bridge abutment/wingwalls from being undermined. Riprap protection will be required for the proposed south abutment. The limits of the riprap will be from 10 ft. upstream of the bridge to 10 ft. downstream of the bridge, for a total riverbank length of 60 ft. The primary effects of riprap installation are the effects of temporary construction related turbidity, which are covered in Section 9.1.1.2 of the SR 161 Puyallup River Bridge Replacement Biological Assessment and the direct impacts of the riprap footprint (Table 1.). The elevations of the riprap are shown on the bridge plans (Attachment E [*SR 162 Puyallup River Bridge Replacement riprap detail plan sheet*]).

**Table 1. Riprap Quantities**

| Type of Material | Volume above OHWM (cy) | Volume below OHWM (cy) | Area above OHWM (sq ft) | Area below OHWM (sq ft) |
|---|---|---|---|---|
| Riprap | 79 | 61 | 1060 | 733 |
| Filter Blanket Gravel | 39 | 36 | * | * |

* Filter blanket gravel is immediately below riprap; therefore area covered is the same.

If you have any additional questions, or require further clarification, please contact Eric Gower at 360-570-6709 (GowerE@wsdot.wa.gov) at your earliest convenience.

Sincerely,

Carl Ward
Biology Program Manager
Olympic Region

CWW:eg:jb:jkb

Attachments: Existing and Proposed Contours
Flow Rating Curve & OHWM Data
Hydraulic Analysis
Demolition Option Plans
Riprap Detail

cc: Michael Lamprecht, ACOE
Ryan McReynolds, USFWS
Jeff Sawyer, WSDOT
Carl Ward, WSDOT
Marion Carey, WSDOT
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